



Case Study of the Month

A Preliminary Report of Penile Transplantation

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Abstract

A 44-year-old male recipient with traumatic penile defect that occurred 8 mo earlier was matched with a 22-year-old, male, brain-dead donor. Transplantation included anastomosis of urethra corpus spongiosum and corpus cavernosum, and sutures of deep dorsal vein, dorsal artery, dorsal nerve, and superficial dorsal vein. Systemic broad-spectrum antibiotics, anticoagulation, antispasm agents, and immunosuppressants were given postoperatively. The recipient could urinate smoothly in a standing position at day 10 after removal of Foley catheter. At day 14 postoperatively because of a severe psychological problem of the recipient and his wife, the transplanted penis was cut off. Pathologic examination showed no rejection.

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1. Case report

Penile defect is rare. Although replantation and reconstruction of the amputated penis have a high success rate, penile transplantation has not been described in the treatment of penile defect. Herein we present the first successful report of penile transplantation under microsurgical techniques.

The recipient, a 44-year-old man, presented with penile defect as a result of an unfortunate traumatic accident. He was saved and managed simply in a rural hospital 8 mo prior to his presentation at our facility. At presentation his proximal penis was approximately 1 cm from the pubis (Fig. 1A), and he could not urinate in a standing position or have intercourse. His quality of life was affected severely.

The donor was a 22-year-old man who was brain-dead; his parents agreed to donate his son's penis to other patients. His amputated penis was 10 cm (Fig. 1B) and was well irrigated with organ preservation solution at 4 °C. The warm ischemic time was 4 min.

Before the operation the donor and recipient were matched with HLA, panel reactive antibody (PRA), and blood type. Informed consent was given by the recipient and the donor's parents. The operation was discussed again and again and approved by the Hospital Medical Ethical Committee.

Under general anesthesia the recipient's proximal stump and donor's penis were irrigated with normal saline. Under microscopic operation the superficial dorsal vein, dorsal arteries, deep dorsal vein, and dorsal nerve fibers were identifiable.

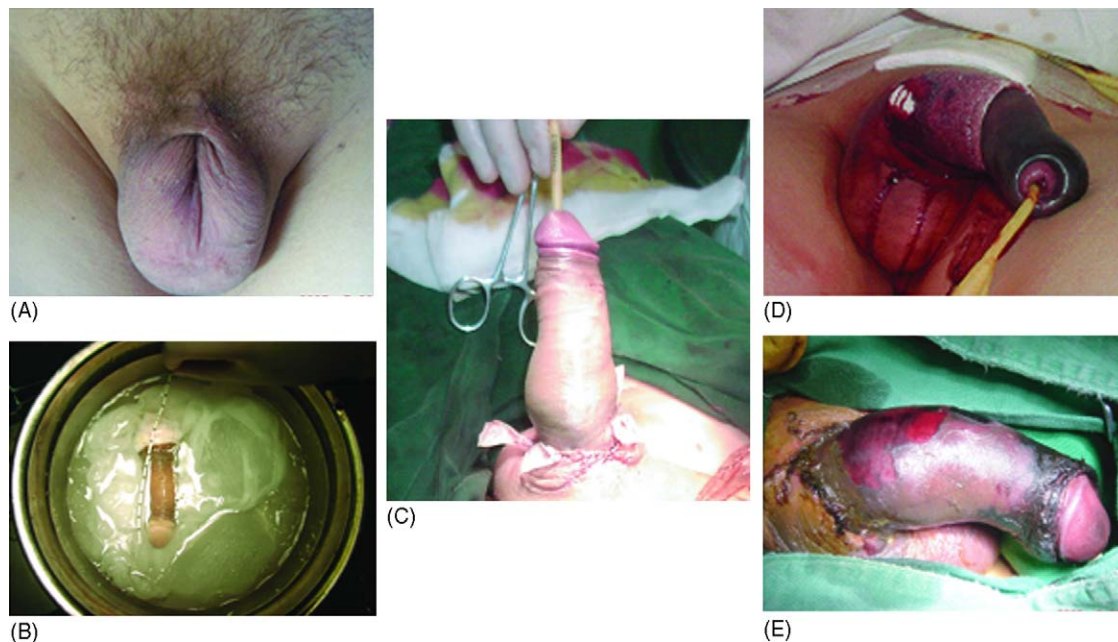


Fig. 1 – Penile transplantation. (A) Preoperative views of penile defect. (B) Donor's penis after being well irrigated. (C) The transplanted penis had excellent cosmetic appearance and circulation at day 1. (D) The transplanted penis became congested and showed evidence of venous stasis and edema; capillary filling remained satisfactory at day 3 postoperatively. (E) The transplanted penis's cosmetic appearance with segmental epidermis necrosis at day 14.

A tourniquet was applied around the proximal stump to gain vascular control of the proximal cavernosum during the procedure. A 16F Foley catheter was inserted through the urethra of the donor's penis to the recipient's proximal urethral stump and passed on into the bladder. End-to-end urethra mucosa anastomosis was formed with 6-0 polyglactin interrupted sutures over the Foley catheter. Then the corpus spongiosum was repaired by using interrupted 6-0 polyglactin sutures. The tunica albuginea was closed with interrupted 5-0 polyglactin to restore corporeal continuity. After that the anastomoses of deep dorsal vein, dorsal artery, and dorsal nerve were performed with interrupted 10-zero nylon sutures. The Buck fascia was loosely approximated with 3-0 interrupted chromic sutures. The anastomosis of the superficial dorsal vein was performed with interrupted 10-0 nylon sutures. Finally the skin was closed with widely spaced 2-0 Vicryl sutures. The penis and glans remained pink with good capillary filling (Fig. 1C). Cold ischemic time was 15.5 h. A mild compressive gauze dressing was placed over the distal penis to control bleeding. The transplanted penis was elevated to facilitate venous and lymphatic drainage postoperatively.

After surgery the transplanted penis was warmed locally by infrared lamp, and the patient was given broad-spectrum antibiotics (Sulperazon) for antimicrobial prophylaxis, anticoagulation (low-mole-

cular dextran was given intravenously at a dose of 500 mg daily), antispasm agents (papaverine and tolazoline were given intramuscularly at doses of 30 mg and 25 mg twice a day, respectively), and immunosuppressants (pre- and intraoperative induction treatment: Zenapax was given intravenously: one dose of 50 mg half an hour before operation; mycophenolate mofetil [MMF] 1000 mg was given orally an hour before operation). Methylprednisolone was given intravenously at a dose of 0.5 g during operation and was given intravenously at a dose of 0.5 g daily at days 1, 2, and 3 postoperatively. Maintenance treatment: MMF + prednisone + cyclosporine (MMF + Pred + CsA) regimen (i.e., MMF was taken orally at a dose of 2000 mg daily). Pred was taken orally at a dose of 24 mg daily. CsA was taken orally at a dose of 420 mg daily. On the third day the shaft of the distal penis became congested with evidence of venous stasis and edema (Fig. 1D), but capillary filling remained satisfactory. Marked penile edema subsided gradually by a dorsal slit of the prepuce, but a small area of distal epidermis progressed to necrosis and was lost. The Foley catheter was removed at the end of postoperative day 10, and the patient voided without difficulty. There was no sign of rejection and infection. The incision skin healed naturally. The concentration of CsA was 160.5 ng/ml at day 5. At day 14 postoperatively because of a severe

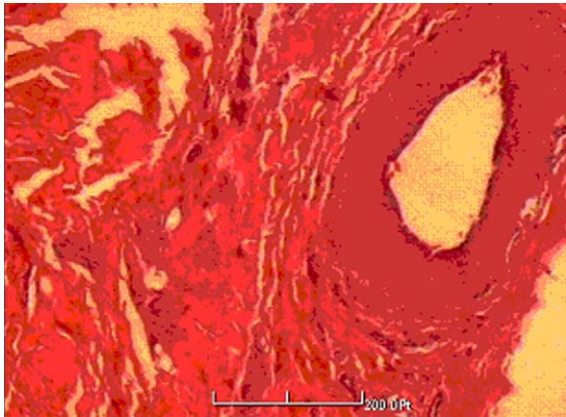


Fig. 2 – High magnification view shows no rejection on transversal section of transplanted penile shaft. (Hematoxylin-eosin staining; original magnification: $\times 200$.)

psychological problem of the recipient and his wife (Fig. 1E), the transplanted penis regrettably had to be cut off. Pathologic examination confirmed no rejection reaction (Fig. 2).

EU-ACME question

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Question:

What is the most suitable option for the treatment of penile defect at present?

- A. penile transplantation
- B. penile reconstruction
- C. penile lengthening
- D. penile replantation